Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (*Withdrawn*) The method of claim 28, wherein for the Mixtures of Experts algorithm the individual experts have a linear form

$$An = \sum_{i=l}^{n} An_i w_i \qquad (1)$$

wherein (An) is an analyte of interest, n is the number of experts, An_i is the analyte predicted by Expert i; and w_i is a parameter, and the individual experts An_i are further defined by the expression shown as Equation (2)

$$An_i = \sum_{j=l}^{m} a_{ij} P_j + z_i \qquad (2)$$

wherein, An_i is the analyte predicted by Expert i; P_j is one of m parameters, m is typically less than 100; a_{ij} are coefficients; and z_i is a constant; and further where the weighting value, w_i, is defined by the formula shown as Equation (3)

$$w_i = \frac{e^{d_i}}{\left[\sum_{k=l}^{n} e^{d_k}\right]} \qquad (3)$$

where e refers to the exponential function, d_i is one of the d_k, d_i and d_k are parameter sets analogous to Equation 2 used to determine the weight w_i, the dk are given by Equation 4

$$d_k = \sum_{j=l}^{m} a_{jk} P_j + \omega_k \qquad (4)$$

where a_{jk} is coefficient, P_j is one of m parameters, and where ω_k is a constant.

2-4. (*Canceled*)

5. (*Withdrawn*) The method of claim 25, wherein the analyte is glucose.

6-14. (*Canceled*).

15. (*Withdrawn*) A monitoring system for measuring an amount or concentration of analyte present in a biological system, said system comprising, in operative combination:

a sensing device in operative contact with the analyte, wherein said sensing device obtains a raw signal from the analyte and said raw signal is specifically related to the amount or concentration of analyte; and

one or more microprocessors in operative communication with the sensing device, wherein said one or more microprocessors comprises programming to control

(i) operation of the sensing device; and

(ii) providing two or more ranges of measurement values, wherein said measurement values are indicative of amounts or concentrations of analyte present in the biological system;

identifying the range in which a selected measurement value falls; and

employing an algorithm for prediction of further measurement values wherein said algorithm is optimized for performance in the identifying range.

16-24. (*Canceled*)

25. (*Withdrawn*) A method for measuring an amount or concentration of analyte present in a biological system, said method comprising:

determining a measurement value indicative of the amount or concentration of analyte present in the biological system;

providing two or more ranges of measurement values;

identifying the range in which said determined measurement value falls;

employing an algorithm for prediction of further measurement values wherein said algorithm is optimized for performance in the identified range; and

generating further measurement values indicative of amount or concentration of analyte present in the biological system using said algorithm.

26. (*Withdrawn*) The method of claim 25, wherein said determining a measurement value indicative of the amount or concentration of analyte present in the biological system comprises obtaining a raw signal specifically related to analyte amount or concentration in the biological system and correlating the raw signal with a measurement value.

27. (*Withdrawn*) The method of claim 25, wherein said determining is carried out using a Mixtures of Experts and said Mixtures of Experts algorithm is trained using a global training set.

28. (*Withdrawn*) The method of claim 25, wherein said algorithm for prediction of further measurement values is a Mixtures of Experts algorithm and said Mixtures of Experts algorithm is trained using data from the identified range.

29. (*Withdrawn*) The method of claim 25, further comprising identifying in which range one or more of the further measurement values falls, and

employing an algorithm for prediction of further measurement values wherein said algorithm is optimized for performance in the identified range.

30. (*Withdrawn*) One or more microprocessors for us in an analyte monitoring system for measuring an amount of concentration of analayte present in a biological system, said one or more microprocessors comprising programming to control:

providing two or more ranges of measurement values, wherein said measurement values are indicative of amounts or concentration of analyte present in the biological system:

identifying the range in which a selected measurement value falls, and

employing an algorithm for prediction of further measurement values wherein said algorithm is optimized for performance in the identified range.

31. (*Withdrawn*) The one or more microprocessors of claim 30, wherein a Mixtures of Experts algorithm is used to determine said selected measurement value and said Mixtures of Experts algorithm is trained using a global training set.

32. (*Withdrawn*) The one more microprocessors of claim 30, wherein said algorithm for prediction of further measurement values is a Mixtures of Experts algorithm and said Mixtures of Experts algorithm is trained using data from the identified range.

33. (*Withdrawn*) The one or more microprocessors of claim 30, wherein said or more microprocessors are further programmed to control operation of a sensing device that provides raw signal specifically related to analyte amount or concentration in the biological system.

34. (*Withdrawn*) The one or more microprocessors of claim 33, wherein said one or more microprocessors are further programmed to control correlating the raw signal with a measurement value indicative of analyte amount or concentration in the biological system.

35. (*Withdrawn*) The one or more microprocessors of claim 32, wherein for the Mixtures of Experts algorithm the individual experts have a linear form

$$An = \sum_{i=l}^{n} An_i w_i \qquad (1)$$

wherein (An) is an analyte of interest, n is the number of experts, An_i is the analyte predicted by Expert i; and w_i is a parameter, and the individual experts An_i are further defined by the expression shown as Equation (2)

$$An_i = \sum_{j=l}^{m} a_{ij} P_j + z_i \qquad (2)$$

wherein, An_i is the analyte predicted by Expert i; P_j is one of m parameters, m is typically less then 100; a_{ij} are coefficients; and z_i is a constant; and further where the weighting value, w_i, is defined by the formula shown as Equation (3)

$$w_i = \frac{e^{d_i}}{\left[\sum_{k=l}^{n} e^{d_k}\right]} \qquad (3)$$

where e refers to the expotential function, d_i is one of the d_k, d_i and d_k are parameter sets analogous to Equation 2 used to determine the weight w_i, the dk are given by Equation 4

$$d_k' = \sum_{j=l}^{m} a_{jk} P_j + \omega_k \qquad (4)$$

where a_{jk} is coefficient, P_j is one of m parameters, and where ω_k is a constant.

36. (*Withdrawn*) The one ore more microprocessors of claim 30, wherein the analyte is glucose.

37. (*Withdrawn*) The monitoring system of claim 15, wherein a Mixtures of Experts algorithm is used to determine said selected measurement value and said Mixtures of Experts algorithm is trained using a global training set.

38. (*Withdrawn*) The monitoring system of claim 15, wherein said algorithm for prediction of further measurement values is a Mixtures of Experts algorithm and said Mixtures of Experts algorithm is trained using data from the identified range.

39. (*Withdrawn*) The monitoring system of claim 15, wherein said sensing device provides a raw signal specifically related to analyte amount or concentration in the biological system and said one or more microprocessors are further programmed to control correlating the raw signal with a measurement value indicative of analyte amount or concentration in the biological system.

40. (*Withdrawn*) The monitoring system of claim 15, wherein for the Mixtures of Experts algorithm the individual experts have a linear form

$$An = \sum_{i=l}^{n} An_i w_i \qquad (1)$$

wherein (An) is an analyte of interest, n is the number of experts, An_i is the analyte predicted by Expert i; and w_i is a parameter, and the individual experts An_i are further defined by the expression shown as Equation (2)

$$An_i = \sum_{j=l}^{m} a_{ij} P_j + z_i \qquad (2)$$

wherein, An_i is the analyte predicted by Expert i; P_j is one of m parameters, m is typically less then 100; a_{ij} are coefficients; and z_i is a constant; and further where the weighting value, w_i, is defined by the formula shown as Equation (3)

$$w_i = \frac{e^{d_i}}{\left[\sum_{k=l}^{n} e^{d_k}\right]} \qquad (3)$$

where e refers to the expotential function, d_i is one of the d_k, d_i and d_k are parameter sets analogous to Equation 2 used to determine the weight w_i, the dk are given by Equation 4

$$d_k = \sum_{j=l}^{m} a_{jk} P_j + \omega_k \qquad (4)$$

where a_{jk} is coefficient, P_j is one of m parameters, and where ω_k is a constant.

41. (*Withdrawn*) The monitoring system of claim 15, wherein the analyte is glucose.

42. (*Withdrawn*) The method of claim 25, wherein said generating further measurement values indicative of amount or concentration of analyte present in the biological system comprises obtaining a raw signal specifically related to analyte amount or concentration in the biological system and using said algorithm to correlate the raw signal with a measurement value.

43. (*Withdrawn*) The method of claim 25, wherein said determining a measurement value indicative of the amount or concentration of analyte present in the biological system compromises a calibration step.

44. (*Withdrawn*) The method of claim 43, wherein said calibrating step correlates a raw signal obtained from a sensing device with a concentration of analyte present in the biological system.

45. (*Withdrawn*) The method of claim 44, wherein said calibration step provides a calibrated signal by a method compromising

$$signal = \frac{BG_{cp}}{active_{cp}}(active)$$

wherein, *signal* is the calibrated signal, BG_{cp} is blood glucose value at a calibration point, $active_{cp}$ is an active signal that corresponds to an electrochemical sensor signal at the calibration point, and *active* is an active signal that corresponds to an electrochemical sensor signal.

46. (*Withdrawn*) The method of claim 44, wherein said calibration step provides a calibrated signal by a method comprising

$$signal = \frac{BG_{cp}}{(active_{cp} + offset)}(active + offset)$$

wherein, *signal* is the calibrated signal, BG_{cp} is blood glucose value at a calibration point, $active_{cp}$ is an active signal that corresponds to an electrochemical sensor signal at the calibration point, *active* is an active signal that corresponds to an electrochemical sensor signal, and *offset* is a value that takes into account a non-zero y-intercept value.

47. (*Currently amended*) A method of calibrating an analyte monitoring device for use in measuring analyte amount or concentration in a biological system, and said method comprising

determining a calibration ratio (CalRatio) value, wherein

$$CalRatio = \frac{BG_{cp}}{(active_{cp} + offset)}$$

wherein BG_{cp} is a blood glucose concentration at the calibration point, , $active_{cp}$ is an active signal that corresponds to an electrochemical sensor signal at the calibration point, and *offset* was a constant value;

providing two or more ranges of CalRatio values;

identifying ~~the~~ a range in which said determined CalRatio value falls;

employing an algorithm ~~for prediction of~~ to predict further measurement values, the algorithm selected from one of a first algorithm and a second algorithm, the first algorithm comprising:

$$BG=w_1BG_1+w_2BG_2+w_3BG_3$$

where

$$BG_1=p_1(\text{time})+q_1(\text{active})+r_1(\text{signal})+s_1(BG|cp)+t_1$$

$$BG_2=p_2(\text{time})+q_2(\text{active})+r_2(\text{signal})+s_2(BG|cp)+t_2$$

$$BG_3=p_3(\text{time})+q_3(\text{active})+r_3(\text{signal})+s_3(BG|cp)+t_3$$

$$w_1=\frac{e^{d_1}}{e^{d_1}+e^{d_2}+e^{d_3}}$$

$$w_2=\frac{e^{d_2}}{e^{d_1}+e^{d_2}+e^{d_3}}$$

$$w_3=\frac{e^{d_3}}{e^{d_1}+e^{d_2}+e^{d_3}}$$

$$d_1=\tau_1(\text{time})+\beta_1(\text{active})+\gamma_1(\text{signal})+\delta_1(BG|cp)+\epsilon_1$$

$$d_2=\tau_2(\text{time})+\beta_2(\text{active})+\gamma_2(\text{signal})+\delta_2(BG|cp)+\epsilon_2$$

$$d_3=\tau_3(\text{time})+\beta_3(\text{active})+\gamma_3(\text{signal})+\delta_3(BG|cp)+\epsilon_3$$

in which BG_i is the analyte predicted, BG/cp is the blood glucose value at a calibration point, time is the elapsed time, ative is the active signal, signal being the calibrated signal, p_i, q_i, r_i are coefficients,

t_i is a constant, e indicates an exponential function, d_i is a parameter set usable to determine weightings w_i, with τ_i, β_i, γ_i, δ_i, and ε_i are constants, and the second equation comprising:

$$BG=w_1BG_1+w_2BG_2+w_3BG_3$$

where

$$BG_1=p_1(\text{time}_c)+q_1(\text{active})+r_1(\text{signal})+s_1(BG|cp)+t_1$$

$$BG_2=p_2(\text{time}_c)+q_2(\text{active})+r_2(\text{signal})+s_2(BG|cp)+t_2$$

$$BG_3=p_3(\text{time}_c)+q_3(\text{active})+r_3(\text{signal})+s_3(BG|cp)+t_3$$

$$w_1=\frac{e^{d_1}}{e^{d_1}+e^{d_2}+e^{d_3}}$$

$$w_2=\frac{e^{d_2}}{e^{d_1}+e^{d_2}+e^{d_3}}$$

$$w_3=\frac{e^{d_3}}{e^{d_1}+e^{d_2}+e^{d_3}}$$

$$d_1=\tau_1(\text{time}_c)+\beta_1(\text{active})+\gamma_1(\text{signal})+\delta_1(BG|cp)+\epsilon_1$$

$$d_2=\tau_2(\text{time}_c)+\beta_2(\text{active})+\gamma_2(\text{signal})+\delta_2(BG|cp)+\epsilon_2$$

$$d_3=\tau_3(\text{time}_c)+\beta_3(\text{active})+\gamma_3(\text{signal})+\delta_3(BG|cp)+\epsilon_3$$

in which BG_i is the analyte predicted, time_c is the elapsed time since calibration, active is the active signal, signal is the calibrated signal, BG/cp is the blood glucose value at a calibration point , p_i, q_i, r_i are coefficients, t_i is a constant, e indicates an exponential function, d_i is a parameter set usable to determine weightings w_i, with τ_i, β_i, γ_i, δ_i, and ε_i are constants, wherein each of said algorithms is optimized for performance in the identified range; and

generating further measurement values indicative of amount or concentration of analyte present in the biological system, said generating comprising obtaining a raw signal specifically related to analyte amount or concentration in the biological system and using said algorithm to correlate the raw signal with a measurement value.

48. (*Withdrawn*) One or more microprocessors for us in an analyte monitoring system for measuring an amount of concentration of analyte present in a biological system, said one or more microprocessors comprising programming to control:

determining a calibration ratio (CalRatio) value, wherein

$$CalRatio = \frac{BG_{cp}}{(active_{cp} + offset)}$$

wherein BG_{cp} is a blood glucose concentration at the calibration point, $active_{cp}$ is an active signal that corresponds to an electrochemical sensor signal at the calibration point, and *offset* was a constant value;

providing two or more ranges of CalRatio values;

identifying the range in which said determined CalRatio value falls;

employing an algorithm for prediction of further measurement values wherein said algorithm is optimized for performance in the identified range; and

generating further measurement values indicative of amount or concentration of analyte present in the biological system, said generating comprising obtaining a raw signal specifically related to analyte amount or concentration in the biological system and using said algorithm to correlate the raw signal with a measurement value.

49. (*Withdrawn*) A monitoring system for measuring an amount or concentration of analyte present in a biological system, said system comprising, in operative combination:

a sensing device in operative contact with the analyte, wherein said sensing device obtains a raw signal from the analyte and said raw singal is specifically related to the amount or concentration of analyte; and

one or more microprocessors in operative communication with the sensing device, wherein said one or more microprocessors comprises programming to control

(i) operation of the sensing device; and

(ii) determining a calibration ratio (CalRatio) value, wherein

$$CalRatio = \frac{BG_{cp}}{(active_{cp} + offset)}$$

wherein BG_{cp} is a blood glucose concentration at the calibration point, $active_{cp}$ is an active signal that corresponds to an electrochemical sensor signal at the calibration point, and *offset* was a constant value;

providing two or more ranges of CalRatio values;

identifying the range in which said determined CalRatio value falls;

employing an algorithm for prediction of further measurement values wherein said algorithm is optimized for performance in the identified range; and

generating further measurement values indicative of amount or concentration of analyte present in the biological system, said generating comprising obtaining a raw signal specifically related to analyte amount or concentration in the biological system and using said algorithm to correlate the raw signal with a measurement value.